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Annual Record of Science and Industry for 1877. Edited by S. F. Baird, with the assistance of eminent men of science. 8vo, pp. 480. New York, Harper & Brothers, 1878.

First Annual Report of the United States Entomological Commission for the year 1877, relating to the Rocky Mountain Locust and the best method of preventing its injuries and of guarding against its invasions; in pursuance of an appropriation made by Congress for this purpose. With maps and illustrations. 8vo, pp. 477, and appendices 294. Washington, 1878. From the Department of the Interior.

Zoölogischer Anzeiger. Herausgegeben von Prof. J. Victor Carus in Leipzig. I Jahrgang. Nos. 1–3. July, 1878. 8vo, pp. 60. Verlag von Wilh. Engelmann, Leipzig. Jährlich erscheinen 25–26 Bogen. Price 6 marks. From the editor.

Tidskrift for Populære Fremstillinger af Naturvidenskaben, udgivet af C. Fogh, C. F. Lütken og Eug. Warming. Femte Raekke, Femte Binds, Tredje Aargang. 8vo, pp. 161–240. Kjöbenhaven, 1878. From the editors.

The Botanical Gazette, August, Sept., 1878, Vol. iii, No. 3. 8vo, pp. 65–72. J. M. & M. S. Coulter, Editors and Publishers, Logansport, Ind., 1878.

The American Journal of Microscopy and Popular Science. Vol. iii, No. 7, New York, July, 1878. From the editor.

Proceedings of the Royal Geographical Society, Vol. xxii, Nos. 2, 3, March and May, 1878. 8vo, pp. 67–229. London. From the Society.

Matériaux pour l'Histoire Primitive et Naturelle de L'Homme. Revue Mensuelle Illustrée dirigée par M. Emile Cartailliac avec le concours de MM. P. Cazalis, Fondouce et Chantre. 2e Serie, Tome ix, 1878. 4e et 5e livraisons with map. 8vo, pp. 147–248. Toulouse, 1878. From the editors.

The Popular Science Monthly, August, 1878, No. lxxvii. Supplements xv, xvi, July and August, 1878, 8vo. New York, D. Appleton & Co. From the editors.

Le Naturaliste Canadien. Redacteur, M. L'Abbe Provancher. Vol. x, No. 6, June, 1878. Cap Rouge, Prov. de Quebec, Canada. From the editor.

Proceedings of the Academy of Nat. Sciences of Phila., 1878. 8vo, pp. 217–264. From the Society.

La Tempestad de los Dias 7 y 8 Abril de 1878. Estudia Meteorologico por el ingeniere civil Vicente Reyes. 8vo, pp. 12 and chart. Mexico, 1878. From the author.

Addenda to etiological views expressed in a paper "On the mechanical genesis of tooth-forms." By J. A. Ryder. 8vo, pp. 3. (Dental Cosmos, Repr.) September, 1878. From the author.

The Bee-keepers' Magazine. Vol. vi, No. 8, August. 8vo, pp. 154–176. New York, A. J. King & Co., 1878.

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GENERAL NOTES.

BOTANY.

THE GRASSES OF MEXICO.—M. Eugéne Fournier has raised the number of species of grasses from eighty-eight, as reported in Kunth's Synopsis, to 638. He finds that sixteen species extend from the shores of the ocean to the elevated plateaux. He also finds, as he had previously done in regard to the ferns, that many species grow on both slopes of the Cordilleras. Out of 162 species common to Mexico and other regions, only two grow in California. East of the Rocky Mountains, Texas has thirty-two species, one grows in the prairie region, and the other fifty-nine United States species are almost confined to Florida, Georgia and South Carolina, scarcely any occurring in Louisiana, Mississippi, or Alabama. The cause of this peculiar distribution may be found in the direction of certain winds, especially the whirlwinds noticed by M. F. F. Hebert, which, descending upon the Gulf of Mexico by the valley of the Rio del Norte, strike the north of Florida, and then sweep northward along the eastern slope of the Alleghanies.

By their geographical distribution and botanical characters, the Mexican *Gramineæ* are divided very clearly into two groups—those which are peculiar to Mexico or common to it, and the Andean region, or to more northern regions, are generally distinguished by the slenderness and lightness of their leaves and panicles; those which spread into the tropical region, on the contrary, are remarkable by their size, and the amplitude of their organs of vegetation and of their inflorescence. The former generally inhabit dry and mountainous localities; the latter the banks of rivers, and moist places; some of them extend from the United States to the Argentine Republic through 70° of latitude (*Comptes rendus* June 10, 1878).

THE CONNECTION OF BACILLI WITH SPLENIC FEVER.—Doubt having been thrown on the supposed fact that splenic fever is caused by *Bacillus anthracis*, Dr. Ewart has published in the Journal of Microscopical Science, the result of his studies. In the spleen of a mouse which had just died of the disease after being inoculated with the plant, the *Bacilli* were found rod-shaped and motionless. In a few hours, the temperature being 30° C. (= 91° F.), many of these rods began to move actively in a wriggling manner, and after continuing in this motile state for some time, they either suddenly or gradually settled down again, and then lengthened out into spore-bearing filaments. A mouse inoculated with the spores thus obtained, died in forty-eight hours of splenic fever. The spores are formed in a similar manner to the Chlamydospores of *Mucor*.

By Koch and some other observers, these spores have been described as germinating at once, and reproducing the rods, but Dr. Ewart found that this process was often preceded by the division of the spore into four sporules, all of which closely adhere at first, but ultimately become free and settle down in colonies. The sporules then germinate and produce the rods. The most important morphological conclusion which Dr. Ewart draws from these other observations is that the *Micrococcus*, *Bacterium* and *Bacillus* forms, and the spore-bearing hyphæ are phases of the same life history. His experiments have been confirmed by other observers.

ASCENT OF SAP IN TREES.—A theory has lately been propounded, and thoroughly worked out by Joseph Böhm, which is said by a writer in *Der Naturforscher*, according to *Nature*, to be characterized by good consistency, and offers perhaps a more satisfactory explanation of the phenomenon than any that have been referred to. It is based, like the osmotic theory, on the cellular structure of all sap-conducting plants, and it attributes an important *rôle* to the *elasticity of the cells.* "When the surface-cells of a plant," says M. Böhm, "have lost a portion of their water through evaporation, they are somewhat compressed by the air-pressure. Like elastic bladders, however, they tend to take their original form. This of course is only possible by their drawing in either air or water from without. Since, however, moist membranes are little penetrable by air, the cells draw from cells farther in a portion of their liquid contents. These again borrow from their neighbors further down, which contain more water, and so on, either to the extreme root-cells or to those parts of the stem which are supplied with water from below through root-pressure."

To illustrate the action, M. Böhm constructed an artificial cell-chain. A funnel closed by a bladder represented the evaporating leaf; to it were connected below several glass tubes about two ctm. wide, closed at one end with a bladder, and joined together in series by means of thick walled caoutchouc tubing. In consequence of the evaporation, the membrane which closes the funnel mouth is bent inwards, and when it has reached a certain tension, water is sucked into the funnel out of the next lower cell, which covers its loss in like manner. Manometers, connected with certain cells of the apparatus, indicate the amount of suction at different heights. To avoid fouling of the membranes, carbolic acid was mixed with the distilled water in the cells. Since bladder membranes, with a not very great height of liquid column over them, admit passage of water by filtration, these artificial cell-chains (it is pointed out), must act much more imperfectly than the sap-conducting cells placed over one another in living plants, which cells, by reason of their narrow aperture, retain their liquid column by capillary attraction.

It is shown that this theory is in harmony with sundry phenomena which are contradictory of the imbibition theory.

AUSTIN'S MUSCI APPALACHIANI.—Supplement I to *Musci exsiccatæ*, containing one hundred tickets of specimens of mosses collected mostly in the eastern part of North America, by Col. F. Austin, will interest botanists. The author proposes to publish additional supplements to both the *Musci* and *Hepaticæ* which have been issued, to comprise one hundred sets of from ten to fifty specimens each. The specimen illustrating the first supplement are to be had for $6 a set.

BOTANICAL NEWS.—Trimen's *Journal of Botany* for July contains a paper on the structure and affinities of *Characeæ*, by A. W. Bennett. A summary is given of Dr. Kienitz-Gerloff's exhaustive study of the development of the capsule of *Phascum cuspidatum.* The *Botanischer Zeitung* contains papers by H. Hoffmann on experiments in culture, and by J. Sachs "on the history of the mechanical theory of growth of organic cells."—The *Annales des*

Sciences Naturelles contains articles by A. Guillaud on the comparative anatomy and development of the stem in Monocotyledons, and by E. Warming on the ovule, and by Van Tieghem on the *Mucorineæ* (third paper).

ZOÖLOGY.[1]

TWO-HEADED SNAKES.—In reference to the two-headed snakes mentioned on pages 264 and 470 of the NATURALIST of the present year, I would say that there exists another specimen without locality in the collection of the Lyceum of Natural History of Williams College. In the same collection is a specimen of a five-legged frog (*Rana sp.*) from Rochester, N. Y. In this the fifth leg is situated between the two posterior pairs and just above the anus, and is in all respects as perfect as the two normal ones. The specimen is about as large as the average *R. palustris*, and, if I remember rightly, belongs to that species.

In "An Essay on the Natural History of Guiana," London, T. Becket and P. A. DeHondt, 1769, the author discourses upon the *Amphisbænæ* of that country, stating that they have a head at each extremity, and "yet, except these there is no animal in nature that is thought to have two heads;" and in a foot note on the same page (214) says: "I have received a particular description of a monstrous *Amphisbæna* found near Lake Champlain in North America by an officer in the American service, who, with one of his Majesty's draughtsmen, was sent during the late war to make a survey of that lake. They were previously informed by the Indians of the existence of these serpents, one of which they killed near a bay in Lake Champlain, which in the maps of that country has been since called Double-headed-snake bay. This serpent was a small one of the kind, it being about fifteen inches in length and largest near the middle, terminating in a slender tail. The body at the other end divided into two necks of equal size, to each of which was joined a perfect head, with two eyes, a large mouth and throat, a forked tongue, with teeth of the same species with those of the rattlesnake. The color of the heads was dark brown, and the scales on the back and side were variegated of dark and reddish-brown colors, in magnitude and disposition resembling those of the rattlesnake. This serpent was a perfect monster, of whose existence I should strongly doubt, did I not think the veracity of the gentlemen from whom I have this information, and by whom it was unquestionably killed, unquestionable."

The frontispiece of the same volume gives a figure of this same specimen, drawn by M. Park, and bearing the inscription "*Amphisbæna* or double-headed snake. This snake was found near

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[1] The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.